Michael P. Nitzsche

EDUCATION

Massachusetts Institute of Technology, Cambridge, MA **Expected May 2021**
S.M. Mechanical Engineering N/A
Rutgers University, School of Engineering, Honors College, New Brunswick, NJ **May 2019**
B.S. Mechanical Engineering, Computer Science, minor in Mathematics GPA: **3.98**/4.00

RESEARCH EXPERIENCE

Atomistic Simulation and Energy Research Group, Massachusetts Institute of Technology August 2019-Present

- Developing molten salt pumps and storage infrastructure for 3rd generation concentrated solar power systems
- Developing methods of CO_2-free hydrogen production through methane cracking in liquid tin

NASA Glenn Research Center, Cleveland OH, *Intern: Propulsion System Analysis Branch* **June 2019-Aug 2019**

- Expanded heat transfer functionality of the NPSS propulsion simulation tool to model heat exchangers in hybrid electric airplanes; contributed to a combined thermal-electrical propulsion model of a turboelectric plane concept

Hybrid Micro/Nanomanufacturing Laboratory, Rutgers U., *Undergraduate Researcher* **Aug. 2016-May 2019**

- Conduct research under Professor Jonathan Singer on projects involving nanomanufacturing through laser annealing and electrospray deposition
- JJ Slade Senior Honors Thesis on focused laser spike dewetting for metrology of thin films
- Senior design project developing a thermocapillary polymer lens for parallelized laser 3D printing

NASA Glenn Research Center, Cleveland OH, *Summer Intern: Nozzles and Inlets Branch* **June 2018-Aug 2018**

- Developed a statistical model to predict flow coefficients in supersonic inlet bleed systems under Stefanie Hirt
- Performed CFD calculations predicting pressure signatures of nose configurations for low-boom supersonic passenger planes

Center for Compact and Efficient Fluid Power, U. of Minnesota, *NSF-REU Research Intern* **June 2017-Aug 2017**

- Machined, assembled, and programmed a test platform to collect data characterizing the performance of a novel, highly efficient hydraulic pump/motor under Professors Thomas Chase and Perry Li

Energy Science and Nanotechnology Laboratory, Rutgers U., *Undergraduate Researcher* **June 2016-Aug 2016**

- Conducted research in thermoelectric properties of organic semiconductors under Professor Mona Zebarjadi

AWARDS & HONORS

- 2019 Tau Beta Pi Graduate Fellowship
- 2019 Rutgers Matthew Leydt Society Inductee
- 2019 Rutgers James J. Slade Scholar
- 2018 Rutgers Cap & Skull Senior Honor Society Inductee
- 2017 Tau Beta Pi Inductee
- 2017 New Jersey Space Grant Consortium Undergraduate Fellowship
- 2015 Rutgers University Presidential Award

PEER-REVIEWED PUBLICATIONS

- Ma, T; **Nitzsche, M. P**.; Gamboa, A. R.; Saro-Cortes, V; Singer, J. P. (2018). Localized Physical Vapor Deposition via Focused Laser Spike Dewetting of Gold Thin Films. *ACS Applied Nano Materials*
- Lei, L., Kovacevich, D. A., **Nitzsche, M. P.**, Ryu, J., Al-Marzoki, K., Rodriguez, G., Klein, L., Jitianu, A., Singer, J. P. (2018). Obtaining Thickness-Limited Electrospray Deposition for 3D Coating. *ACS Applied Materials & Interfaces*

CONFERENCE PROCEEDINGS

- Gamboa, A.M.; **Nitzsche, M.P.;** Saro-Cortes, V.; Ma, T.; Lei, L.' Singer, J.P.; (2018). Thermocapillary Multidewetting of Thin Films. *MRS Advances*
- Kovacevich, D.; **Nitzsche, M. P.**; Saro-Cortes, V.; Gamboa, A. R.; Davis, E. D.; Ma, T.; Singer, J. P.; (2019). Thermocapillary Dewetting-Based Dynamic Spatial Light Modulator, *World Congress on Micro and Nano Manufacturing*
- Chapman, J. W.; Schnulo, S.L.; **Nitzsche, M.P.**; (2020). Development of a Thermal Management System for Electrified Aircraft, *AIAA SciTech Forum and Exposition*

PRESENTATIONS

- **Nitzsche, M.P.,** *FLaSk Rheology of Polymer Thin Films,* 10th Northeast Complex Fluids and Soft Matter Workshop, Rutgers University, New Brunswick, NJ, January 18, 2019

- **Nitzsche, M.P.,** *Laser-Induced Thermocapillary Reorientation of Liquid Crystal Elastomers,* American Physical Society March Meeting, Los Angeles, CA, March 6, 2018
- **Nitzsche, M.P.,** *Effects of Charge Dissipation on Self-Limiting of Electrospray Deposition,*7th Northeast Complex Fluids and Soft Matter Workshop, Princeton University, Princeton, NJ, May 25, 2017

ENGINEERING EXPERIENCE

Engineers Without Borders, Rutgers University, *Technical Team Member: Camden Project* **Sept 2015-Dec 2017**

- Designed and built solar powered rainwater irrigation systems for sustainable community gardens in Camden, NJ

INSTITUTIONAL SERVICE EXPERIENCE

Engineering Governing Council, Rutgers University, *External Vice President* **Sept 2015-May 2019**

- Vice President of the Rutgers School of Engineering Student Government (2018-2019)
- Chair of University Affairs (2016-2018): organized two student body wide surveys for the administration, co-initiated the first Sustainability in Engineering Research Fair

Aresty Research Center, Rutgers University, *Senior Peer Instructor* **Aug 2017-May 2019**

- Led biweekly meetings to introduce new undergraduate researchers to the research process

Mechanical Engineering Student Association, Rutgers University, *Class Officer* **Sept. 2017-May 2019**

- Collaborated with students and faculty on departmental initiatives

Tau Beta Pi New Jersey Beta Chapter, Rutgers University, *Engineering Futures Chair* **Dec 2017-Dec 2018**

- Organized workshops for students to learn soft skills from industry professionals

Rutgers Research Review, Rutgers University, *Co-Editor-In-Chief* **May 2018-May 2019**

- Editor for an online research magazine featuring articles written by Rutgers undergraduates

Energy Club, Massachusetts Institute of Technology, *Panel Director* **Sept 2019-Present**

- Developing panel on decarbonizing aviation for the largest student-run energy conference in the U.S.

SPECIALIZED SKILLS

Software and Languages: *Proficient:* Java, C, MATLAB, SolidWorks, Excel, Simulink, Inkscape, Python, COMSOL *Familiar:* LabVIEW, C++, AutoCAD, ProE Creo, Design Expert, Cart3D, OpenMDAO, NPSS, FactSage
Fabrication Skills: Operation of lathes, mills, CNC water cutters, drills. 3D printing, sawing, wiring, soldering
Laboratory Skills: spin-coating, blade-coating, laser annealing, photolithography, optomechanical assembly operation, plasma sputtering, Filmetrics film thickness measurement, Netzsch diffusivity measurement, Netzsch thermomechanical analysis, microscopy, electrospray deposition, multimeters, oscilloscopes, data acquisition
Relevant Coursework: Thermodynamic Theory, Advanced Fluid Mechanics, Thermodynamics, Heat Transfer, Aerodynamics, Mechatronics, Multiphysics Simulations, Systems Programming, Algorithms, Artificial Intelligence